

REMARKS

Claims 1-4 were pending in the present application. By virtue of this response claim 1 has been amended without prejudice or disclaimer of any previously claimed subject matter and new claims 5-9 have been added. Support for the amendment to claim 1 and new claims 5-9 may be found throughout the present application; for example, from page 8, line 11 through page 11, line 28 and from page 17, line 20 to page 20, line 24. Accordingly, claims 1-9 are currently under consideration. Amendment of certain claims is not to be construed as a dedication to the public of any of the subject matter of the claims as previously presented.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attachment is entitled "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

Rejections Under 35 U.S.C. § 102(e)

Claims 1-4 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Ogawa et al. (U.S. Patent No. 6,455,877).

Claim 1 as amended is directed to a nitride-based semiconductor light emitting device including, *inter alia*, "a silicon doped n-type GaN-based substrate." Support for the amendment to claim 1 is found in the present application at least from page 8, line 11 to page 11, line 28. For example, on page 8, lines 13-15 the specification recites that the "light emitting device includes an Si-doped n-type GaN substrate 301."

Applicant submits that Ogawa et al. do not disclose or suggest a nitride semiconductor light emitting device including "a silicon doped n-type GaN-based substrate ...having an interface region contacting said semiconductor stacked-layer structure and said interface region containing oxygen atoms at concentration n in the range of $2 \times 10^{16} \leq n \leq 10^{22} \text{ cm}^{-3}$," as recited in claim 1. Ogawa et al. do not disclose using a silicon doped n-type GaN-based substrate and where the substrate includes an interface region containing oxygen atoms. In contrast to Ogawa

et al., amended claim 1 recites that an impurity other than oxygen is included in the GaN-based substrate and oxygen is doped in the interface region. As described in the present application, for example, an impurity other than oxygen is used to improve the conductivity of the GaN-based substrate, and oxygen is included in the interface region to reduce crystal defect density in the semiconductor stacked-layer structure grown on the substrate. See, e.g., page 3, lines 5-13.

Therefore, a nitride-based semiconductor light-emitting device with the features of claim 1 is not disclosed or suggested by Ogawa et al. Claims 2-4 are not disclosed or suggested by Ogawa et al. for at least the same reasons as claim 1. Accordingly, Applicant requests withdrawal of the rejection and allowance of claims 1-4.

New Claims

New claims 5-9 were added to particularly claim certain aspects of the present invention. Support for new claims 5-9 may be found in the present application, for example, from page 17, line 20 to page 20, line 24. Accordingly, no new matter has been added.

Applicant submits that claims 5-9 are allowable over the applied reference of Ogawa et al. because Ogawa et al. fail to disclose or suggest the features of claims 5-9. In particular, Ogawa et al. fail to disclose or suggest a nitride-based semiconductor light emitting device including, *inter alia*, “a GaN-based substrate including a p-type impurity...having an interface region contacting said semiconductor stacked-layer structure and said interface region containing oxygen atoms at concentration n in the range of $2 \times 10^{16} \leq n \leq 10^{22} \text{ cm}^{-3}$,” as recited by claim 5. Accordingly, Applicant submits that claims 5-9 are allowable.

Conclusion


Applicant has, by way of the amendments and remarks presented herein, made a sincere effort to overcome the rejections and address all issues that were raised in the outstanding Office Action. Accordingly, reconsideration and allowance of the pending claims are respectfully requested. If it is determined that a telephone conversation would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 245402004200.

Respectfully submitted,

Dated: January 24, 2003

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claim 1 has been amended as follows:

1. (Amended) A nitride-based semiconductor light-emitting device comprising:
a silicon doped n-type GaN-based substrate; and
a semiconductor stacked-layer structure including a plurality of nitride-based semiconductor layers grown on said GaN-based substrate by vapor phase deposition,
said GaN-based substrate having an interface region contacting said semiconductor stacked-layer structure and said interface region containing oxygen atoms at concentration n in the range of $2 \times 10^{16} \leq n \leq 10^{22} \text{ cm}^{-3}$.

Claims 5-9 are new.